

**CLAIMS:**

1. An imaging engine configured and dimensioned to fit within a predetermined form factor of an optical code reader, said imaging engine comprising:
  - an imaging assembly including at least one image sensor;
  - 5 at least one illumination assembly having at least one illuminating device, the at least one image sensor and the at least one illuminating device being provided on a substrate; and
  - an interface having at least one signal path configured for providing at least one control signal to the imaging assembly.
- 10 2. The imaging engine of claim 1, wherein the at least one signal path transfers the at least one control signal between the imaging assembly and circuitry of the optical code reader.
3. The imaging engine of claim 2, wherein the at least one signal path is selected from the group consisting of an electrical, an optical, and a wireless path.
- 15 4. The imaging engine of claim 1, wherein said imaging engine is an integrated circuit package.
5. The imaging engine of claim 1, wherein the at least one image sensor is configured for being positioned in an optical beam path of the optical code reader.
- 20 6. The imaging engine of claim 1, further comprising a transmissive optical element overlaying the outer surface of the substrate.

7. The imaging engine of claim 1, wherein said substrate is a semiconductor.

8. The imaging engine of claim 1, wherein the at least one illuminating device includes at least two light-emitting diodes providing at least two different output wavelengths.

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9. The imaging engine of claim 1, wherein the substrate includes portions for placement of the image sensor and the illumination assembly, such that the image sensor and the illumination assembly are substantially flush with an outer surface of the substrate.

10 10. The imaging engine of claim 1, wherein the at least one illuminating device is selected from the group consisting of an LED, a semiconductor laser, and a flash module.

11. The imaging engine of claim 1, further comprising a targeting assembly, wherein the at least one signal path provides at least one control signal to the targeting assembly.

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12. An optical code reading system for imaging an optical target, said system comprising:  
an optical code reader; and  
an imaging engine having structure for connecting to the optical code reader, an interface  
20 for communicating with circuitry of said optical code reader, and an illumination assembly  
including at least one illuminating device.

13. The optical code reading system of Claim 12, wherein the at least one illuminating device includes a plurality of light-emitting diodes having an output of at least two different wavelengths, said illumination assembly communicating with circuitry of said optical code reader via said interface.

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14. The optical code reading system of claim 12, wherein the imaging engine includes a transmissive optical element located on a face of said imaging engine.

15. The optical code reading system of claim 12, wherein said imaging engine is an integrated circuit package.

16. The optical code reading system of claim 12, wherein said imaging engine further includes at least one image sensor and a targeting assembly, said at least one image sensor and targeting assembly communicating with circuitry of said optical code reader via said interface.

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17. The optical code reading system of claim 12, further comprising another imaging engine configured for being interchanged with the imaging engine.

18. A method for reading an optical code using an optical code reader comprising the steps of:

aiming the optical code reader at the optical code;

activating the optical code reader to generate and propagate at least one signal output from at least one illuminating device, the at least one signal output is reflected by the optical code to produce at least one reflected signal;

impinging the at least one reflected signal onto an image sensor; and

5 processing the at least one reflected light signal to generate an output data signal.

19. The method of claim 18, wherein the step of activating the optical code reader includes the step of transmitting a control signal to an illumination assembly having the at least one illuminating device to generate and propagate the at least one signal output.

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20. The method of claim 18, wherein at least the at least one illuminating device and the image sensor from an integrated circuit package.

21. An optical code reading kit, said kit comprising:

15 an optical code reader; and

at least two plug-and-play imaging engines configured and dimensioned for alternative placement within a form factor of the optical code reader, said imaging engines having respective interfaces for communicating with circuitry of said optical code reader.

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22. The optical code reading kit of claim 21, wherein each of said at least two plug-and-play imaging engines includes an illumination assembly having at least one illuminating device.

23. A method for changing an imaging engine in an optical code reader comprising the steps of:

removing a first, plug-and-play imaging engine from the optical code reader by disconnecting said first, plug-and-play imaging engine from the optical code reader; and

5 connecting a second, plug-and-play imaging engine to the optical code reader, wherein first and second plug-and-play imaging engines are dimensioned to fit within a substantially identical form factor of the optical code reader and to interface with circuitry of the optical code reader.

10 24. The method according to Claim 23, wherein each of the first and second plug-and-play imaging engines are integrated circuit packages having an illumination assembly including one illuminating device.

15 25. The method according to Claim 23, wherein each of the first and second plug-and-play imaging engines have a transparent overlay overlaying at least one surface thereof.

26. The method according to Claim 23, wherein each of the first and second plug-and-play imaging engines are integrated circuit packages having an illumination assembly including a plurality of illuminating devices for emitting an output having at least two different wavelengths.

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27. An imaging engine, integrated circuit package comprising:  
a substrate;  
an image sensor disposed on said substrate;

an illumination assembly disposed on said substrate having at least one illumination device substantially flush with an outer surface of the substrate; and an optical element overlaying the at least one illumination device.

5           28.     The package of claim 27, further comprising a targeting assembly having at least one illumination device substantially flush with the outer surface of the substrate.

10          29.     The package of claim 27, wherein said package is configured and dimensioned to fit within a predetermined form factor of an optical code reader, and wherein said package is a plug-and-play component.

30.     The package of claim 27, further comprising interface means for interfacing the image sensor and the illumination assembly with circuitry of an optical code reading system.